

ABSTRACT OF THE DISCLOSURE

Systems and methods are provided for navigated placement of bone engaging elements, such as support pins used to support a cutting block on a bone for resection. In one embodiment, a tool configured to drive a pin into a bone is outfitted with a position tracking element. The system includes a localizing device that senses a signal from the position tracking element and feeds position information to a processor that makes a real-time comparison of the position of the tool to a location on the bone for placing the pin. When the tool spatial position coincides with the location on the bone, an annunciator is activated providing an audible or visible signal to the surgeon to operate the tool. In another embodiment, when the spatial position coincides, the processor directs an on-board controller of the tool to activate the tool. In another embodiment of the invention, the tool is continuously operating and the on-board processor controls a sheath that initially covers the working end of the tool. In yet another embodiment, a guide apparatus is configured to be mounted to a bone and provides multi-degree of freedom gross and fine adjustments of a pin guide. The pin guide carries a position tracking element so that its real-time spatial position relative to a location on the bone can be evaluated.